



west virginia department of environmental protection

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**GENERAL PERMIT REGISTRATION APPLICATION
ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Registration No.:	R13-3272
Plant ID No.:	103-00053
Applicant:	Williams Ohio Valley Midstream, LLC (Williams)
Facility Name:	Wetzel Gas Gathering System (WGGS) Compressor Station
Location:	Jacksonburg, Wetzel County
SIC Code:	1311
NAICS Code:	211111
Application Type:	Modification
Received Date:	September 18, 2015
Engineer Assigned:	David Keatley
Fee Amount:	\$4,500
Date Fee Received:	September 21, 2015
Complete Date:	November 23, 2016
Due Date:	February 23, 2016
Applicant Ad Date:	September 23, 2015
Newspaper:	<i>Wetzel Chronicle</i>
UTM's:	Easting: 531.499 km Northing: 4,371.063 km Zone: 17
Description:	Permit R13-3272 will supersede and replace permit registration G35-A087. Modified emissions for two (2) 1,380-bhp engines, one (1) 40-mmscfd TEG dehydration unit & associated 1.0 mmBtu/hr reboiler, 210-bbl tank emissions, and SSM. Inclusion of truck loading, compressor, and fugitive emissions.

TYPE OF PROCESS

This facility is a compressor station and dehydration facility which will compress the natural gas to a higher pressure and reduce the water content of the natural gas. Natural gas from nearby well-pads owned and operated by other companies enter the facility via pipeline and goes to an inlet separator. The liquids from the inlet separator goes to one (1) 210-bbl pipeline liquids tank (T01). The gas from the inlet separator is compressed to a higher pressure by two compressors. The compressors are powered by two (2) 1,380-bhp four-stroke lean-burn Caterpillar G3516B compressor engines (CE-01 and CE-02). Natural gas at a maximum rate of 40 mmscfd will flow countercurrent to triethylene glycol (TEG) in a contactor tower. The

compressed dehydrated natural gas will exit the facility via pipeline. The liquid (rich TEG) from the contactor goes to a flash tank (DSV-01) where the vapors from the flash tank will be used as fuel for a 50% emissions reduction. The liquid from the flash tank will go to the regenerator which is heated by one (1) 1.0-mmBtu/hr reboiler (RBV-01). The vapors from the still vent will be sent to a condenser and then be used as fuel in the reboiler when the reboiler is in operation for a minimum 95% control efficiency. All fuel burning equipment uses natural gas as fuel.

SITE INSPECTION

A site inspection was conducted on September 1, 2015 by Doug Hammell of the DAQ Enforcement Section. The site was deemed in compliance.

Latitude: 39.488597

Longitude: -80.63370



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of the combustion emissions from the two compressor engines (CE-1, CE-2), one (1) pipeline liquids tank (T01), one (1) glycol dehydration unit (RBV-1), SSM, rod packing & crankcase, and fugitive emissions.

Table 1: Calculation Methodology

Emission Unit ID#	Process Equipment	Calculation Methodology
CE-1 and CE-2	1,380 hp Caterpillar G3516B Compressor Engine with catalytic converter ¹	Manufacturer's Data, EPA AP-42 Emission Factors
RBV-1	40 mmscf/d TEG Glycol Dehydration Unit	GRI-GlyCalc and EPA AP-42 Emission Factors
T01	210 bbl Produced Water and Condensate Tanks	ProMax and Flash Factor

¹ Per Caterpillar, NMNEHC emission factor does not include formaldehyde, therefore, NMNEHC and formaldehyde factors have been added to arrive at total VOC. In addition, per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

The still vent vapors (VOC, BTEX) from the TEG dehydration unit are controlled with a JATCO BTEX Eliminator.

Fugitive emissions for the facility are based on calculation methodologies presented in the EPA's Protocol for Equipment Leak Emission Estimates. Fugitive VOC emissions were calculated using a representative gas analysis and the weight percent of VOC.

Table 2: New/Modified Maximum Controlled PTE

Emission Point	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
1E	Caterpillar G3516B Compressor Engine CE-1 (1,380 bhp)	Nitrogen Oxides	1.52	6.66
		Carbon Monoxide	0.64	2.82
		Volatile Organic Compounds	2.14	9.36
		Particulate Matter-10	0.11	0.50
		Sulfur Dioxide	0.01	0.03
		Formaldehyde	0.28	1.22
		Carbon Dioxide Equivalent	1,720	7,536
2E	Caterpillar G3516B Compressor Engine CE-2 (1,380 bhp)	Nitrogen Oxides	1.52	6.66
		Carbon Monoxide	0.64	2.82
		Volatile Organic Compounds	2.14	9.36
		Particulate Matter-10	0.11	0.50
		Sulfur Dioxide	0.01	0.03
		Formaldehyde	0.28	1.22
		Carbon Dioxide Equivalent	1,720	7,536
3E	Compressor Rod Packing/ Engine Crankcase	Volatile Organic Compounds	0.78	3.44
		Formaldehyde	0.02	0.08
4E	SSM	Volatile Organic Compounds	-	10.03

		n-Hexane	-	0.10
5E	TEG Dehydrator Flash Tank DFT-01	Volatile Organic Compounds	12.11	53.05
		Benzene	0.02	0.14
		Ethylbenzene	0.03	0.15
		n-Hexane	0.18	0.81
		Toluene	0.11	0.39
		Xylenes	0.17	0.73
6E	TEG Dehydrator Still Vent DSV-01	Volatile Organic Compounds	0.16	0.70
		Benzene	0.01	0.03
		Ethylbenzene	0.01	0.03
		Toluene	0.02	0.09
		Xylenes	0.04	0.18
7E	TEG Dehydration Reboiler RBV-01	Nitrogen Oxides	0.10	0.43
		Carbon Monoxide	0.08	0.36
		Volatile Organic Compounds	0.01	0.02
		Particulate Matter-10	0.01	0.03
		Carbon Dioxide Equivalent	118	518
8E	Storage Tank T-01	Volatile Organic Compounds	0.03	0.11
9E	Truck Loading TLO	Volatile Organic Compounds	-	0.12
FUG-G	Fugitive Emissions - Gas	Volatile Organic Compounds	0.58	2.55
FUG-W	Fugitive Emissions – Oil	Volatile Organic Compounds	0.88	3.84

Table 3: Facility Wide PTE

Pollutant	Annual Emissions (tons/year)
Nitrogen Oxides	13.76
Carbon Monoxide	5.99
Volatile Organic Compounds	92.58
Particulate Matter-10	1.03
Sulfur Dioxide	0.06
Formaldehyde	2.52
Benzene	0.35
Ethylbenzene	0.33
n-Hexane	1.43
Toluene	0.66
Xylenes	1.07
Total HAPs	7.64
Carbon Dioxide Equivalent	25,829

REGULATORY APPLICABILITY

The following rules and regulations apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed fuel burning unit (RBV-01) is below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, this facility would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six-minute block average.

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of all of the proposed fuel burning units (RBV-01) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

The VOC PTE for the proposed change exceed the thresholds of 6 lb/hr and 10 tons/year and therefore this facility requires a modification permit.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source as can be seen in Table 3 and not subject to 45CSR30 since the regulations this facility is subject to are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71. This facility has a total reciprocating engine capacity greater than 1,000 hp and is an 8D source and is required to pay a \$500 annual fee. Williams is required to keep their Certificate to Operate current.

40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities)

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. This facility is a natural gas production facility that processes, upgrades, or stores natural gas prior to transmission. This facility is an area source of HAPs refer to the previous facility wide emissions table.

Pursuant to §63.760(b)(2), each glycol dehydration unit (GDU) located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e)(2) “actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year.”

As can be seen above in Table 1, the maximum PTE of benzene emissions from the GDU process vents is 0.17 TPY. Therefore, the GDU is exempt from the Subpart HH requirements given under §63.764(d).

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This facility is subject to the area source requirements and has non-emergency spark ignition engines.

Engine CE-1 through CE-2 are "New Stationary RICE" sources at an area source of HAPs and are affected source because construction commenced after June 12, 2006 [63.6590(a)(2)(iii)].

Stationary RICE subject to Regulations under 40 CFR Part 60 must meet the requirements of those subparts that apply (40 CFR 60 Subpart JJJJ, for spark ignition engines) if the engine is a new stationary RICE located at an area source (§63.6590(c)(1)). No additional requirements apply for these engines under this subpart.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

Engines (CE-1 and CE-2) are subject to 40CFR60 Subpart JJJJ because construction was after June 12, 2006, the engines were manufactured after July 1, 2007, and are greater than 500 hp.

[40CFR60.4230(4)(i)]

40CFR60.4248 Table 1 provides the allowable emission standards for stationary spark ignition internal combustion engines. Engines (CE-1 and CE-2) are non-emergency hp≥500 manufacturer date after July 1, 2007 the allowable emission standards in g/hp-hr are: 1.0, NO_x; 2.0, CO; and 0.7, VOC. The engines will also have operating limits, performance tests, notification requirements, and recordkeeping requirements.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA issued its new source performance standards (NSPS) and air toxics rules for the oil and gas sector on April 17, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

- a. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There will be two (2) reciprocating compressor associated with CE-1 and CE-2 at this facility. These compressors were delivered after to the effective date of this regulation and are subject to this section of this regulation. Requirements include replacing rodpacking systems on a specified schedule, monitoring, recordkeeping, and reporting.

- b.
 - 1. Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.
 - 2. Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

The pneumatic controllers at this facility will be intermittent or will vent less than 6 scf/hr and therefore this facility is not subject to this section of this regulation.

- c. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- 1. Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- 2. Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- 3. Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup.

Tank T-01 was constructed after August 23, 2011, however will emit less than 6 tpy each and this facility is not subject to this section of this regulation.

The following rules and regulations do not apply to the facility:

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. Tank T-01 at this facility is less than 75 cubic meters; therefore, this tank is not subject to this regulation.

40CFR60 Subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

This subpart establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. The effective date of the rule is August 2, 2016.

No potential affected facility under this subpart was constructed or modified after September 18, 2015 and therefore this facility is not subject to this subpart.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following HAPs as emitted in substantive amounts: Benzene, Ethylbenzene, n-Hexane, Toluene, Formaldehyde, and Xylenes. The following table

lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 3: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Benzene	TAP/HAP/VOC	Yes	Category A - Known Human Carcinogen
Formaldehyde	TAP/HAP/VOC	Yes	Category B1 - Probable Human Carcinogen
n-Hexane	HAP/VOC	No	Inadequate Data
Ethylene	HAP/VOC	No	Category D - Not classifiable as to human carcinogenicity
Toluene	HAP/VOC	No	Inadequate Data
Xylenes	HAP/VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. This facility is a minor source of HAPs as can be seen in Table 2. For a complete discussion of the known health effects of each compound refer to the IRIS database located at www.epa.gov/iris.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The WGGs Compressor Station is located in Wetzel County and will be operated by Williams.

1. The WGGs Compressor Station will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding compressor stations operated by Williams that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the WGGs Compressor Station does share the same SIC code as the surrounding compressor stations.
2. "Contiguous or Adjacent" determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms "contiguous" or "adjacent" are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

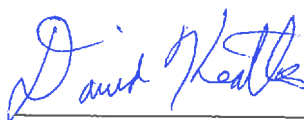
There are no other Williams' facilities that are contiguous or adjacent with the WGGs Compressor Station.

3. According to Williams, none of the wells in the area are owned by Williams. Furthermore, no well is dependent on the operation of the WGGs Compressor Station to function, nor is the WGGs Compressor Station dependent on any specific well to operate. From this analysis, Williams is not under common control with other wells in the area. However, the WGGs Compressor Station is under common control with other compressor stations in the area.

Because the facilities are not considered to be on contiguous or adjacent properties, the emissions from the WGGs Compressor Station should not be aggregated with other facilities in determining major source or PSD status.

RECOMMENDATION TO DIRECTOR

Williams' request to construct a natural gas compressor station at the Jacksonburg, Wetzel County, WV site meets the requirements of General Permit G35-A and all applicable rules and regulations and therefore should be granted a General Permit Registration to construct and operate the said facility.



David Keatley
Permit Writer – NSR Permitting

December 6, 2016

Date